

REMARKS

Allowed claim

Applicants acknowledge and appreciate allowance of claim 26.

Claims 1, 27-38, 40, 41 and 45

Claims 1, 27-38, 40, 41 and 45 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Attia (US6080281) in view of Barnhard IV et al. (US4058420) and in yet further view of the article from Science and Technology Review.

Claim 1 has been amended to require that the energetic material includes a fuel and an oxidizer or a reaction product of a fuel and an oxidizer. Support for this amendment is found, *inter alia*, on p. 1, lines 13-17 of the present application as filed.

As noted in the "Response to Arguments" section of the office action, the prior art of record fails to disclose or suggest actual energetic materials. Therefore, by virtue of the amendment, claim 1 is believed to be allowable. Reconsideration and allowance of claim 1 is respectfully requested.

Claims 27-31 and 33-38 depend from claim 1, and therefore incorporate the limitations of claim 1. By virtue of their dependence, claims 27-31 and 33-38 are also believed to be allowable. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Reconsideration and allowance of claims 27-31 and 33-38 is respectfully requested.

Additionally, regarding claim 27, nowhere does Attia, Barnhard, or the article from Science and Technology Review disclose or suggest that materials are crystallized within pores of a sol-gel derived solid. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 28, nowhere does Attia, Barnhard, or the article from

Science and Technology Review disclose or suggest solution exchange involving exchanging the liquid phase after gelation with another liquid containing an energetic material constituent, thereby allowing deposition of the energetic material constituent within the gel. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 30, nowhere does Attia, Barnhard, or the article from Science and Technology Review disclose or suggest utilizing reactive monomers which have functionalized sites dangling throughout the solid network after gelation, and controlling the number of functionalized sites while ensuring homogeneity at a molecular level. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 33, nowhere does Attia, Barnhard, or the article from Science and Technology Review disclose or suggest wherein the energetic material is uniformly distributed within pores of a solid network formed by the polymerization of the reactive monomer. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 34, nowhere does Attia, Barnhard, or the article from Science and Technology Review disclose or suggest after gelation, exchanging the liquid phase with another liquid which contains an energetic material constituent. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 36, nowhere does Attia, Barnhard, or the article from Science and Technology Review disclose or suggest utilizing reactive monomers which have functionalized sites dangling throughout the solid network, and dissolving an energetic material in mutually compatible solvents and diffusing into the gel which allows the energetic material to react and bind to the functionalized site. For this reason as well, the claim is believed to be allowable.

Regarding claim 32, Applicants respectfully believe that the rejection is improper.

Applicants respectfully assert that the rejection fails the *Graham* test.

The analysis of obviousness was set forth in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). In order to establish a *prima facie* case of obviousness, three basic criteria must be met:

First, there must be some *suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings of the references. Second, there must be a *reasonable expectation of success*. Finally, the prior art reference or combined references must teach or suggest *all the claim limitations*. *The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art*, and not based on applicant's disclosure (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991; *emphasis added*).

Applicants respectfully traverse the rejection as failing the *Graham* test. Specifically, the combination proposed in the rejection fails at least the first and third elements of the *Graham* test.

Regarding the third element of the *Graham* test, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Claim 32 requires making solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials.

In sharp contrast, Attia fails to disclose or suggest solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials. Particularly, Attia indicates that all materials in the aerogel are incorporated in the matrix, with nothing in the void spaces. *See, inter alia*, Attia col. 6, lines 45-49 and col. 7, lines 13-16. Nor does Attia suggest a solid structure with materials in the voids. Attia's structure is meant to capture vaporous and gaseous contaminants from an air stream contacting the aerogel. *See* Attia, col. 5, line 65 *et seq.* Attia further indicates that the "...aerogels of the invention typically have over 90% porosity...." *See* Attia col. 7, lines 48-49. Accordingly,

if anything, Attia teaches away from materials being present in the voids.

Similarly, the article from Science and Technology Review fails to disclose whether any material is present in the void spaces, much less fuels, oxidizers, or other energetic composite materials.

For the foregoing reasons, the rejection fails the third element of the *Graham* test and must be withdrawn.

Regarding the first element of the *Graham* test, Attia teaches away from the claimed invention. A *prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997). It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Particularly, Attia teaches away from having material present in voids of the matrix. For example, col. 6, line 62 *et seq.* indicates that inert portion of the matrix provide additional space so that the surface reaction products/intermediates do not block access to other photoactive sites on the matrix. Thus, Attia teaches the desirability of open void spaces. As another example, Attia indicates that the "...aerogels of the invention typically have over 90% porosity Attia goes on to state that 'Because of these properties, these aerogels can capture (sorb) several times their weight of the gaseous effluents.' ...." See Attia col. 7, lines 48-56. Accordingly, Attia teaches the desirability of a high porosity, and thus away from materials in the voids.

For the foregoing reasons, the rejection fails the first element of the *Graham* test and must be withdrawn.

Claims 40 and 41 depend from claim 32, and therefore incorporate the limitations of claim 32. By virtue of their dependence, claims 40 and 41 are also believed to be allowable. Reconsideration and allowance of claims 40 and 41 is respectfully requested.

Claim 45 has been amended to require producing a solid energetic material comprising at least one of an explosive, a propellant, and a pyrotechnic. Support for this amendment is found,

*inter alia*, on p. 1, lines 8-12 of the present application as filed.

As noted in the “Response to Arguments” section of the office action, the prior art of record fails to disclose or suggest actual energetic materials. Therefore, by virtue of the amendment, claim 45 is believed to be allowable. Reconsideration and allowance of claim 45 is respectfully requested.

Claims 1, 27-38, 40, 41 and 45

Claims 1, 27-38, 40, 41 and 45 have been rejected under 35 U.S.C. 102(b) as being anticipated by the article from Science and Technology Review.

Claim 1 has been amended to require that the energetic material includes a fuel and an oxidizer or a reaction product of a fuel and an oxidizer. Support for this amendment is found, *inter alia*, on p. 1, lines 13-17 of the present application as filed.

As noted in the “Response to Arguments” section of the office action, the prior art of record fails to disclose actual energetic materials. Therefore, by virtue of the amendment, claim 1 is believed to be allowable. Reconsideration and allowance of claim 1 is respectfully requested.

Claims 27-31 and 33-38 depend from claim 1, and therefore incorporate the limitations of claim 1. By virtue of their dependence, claims 27-31 and 33-38 are also believed to be allowable. Reconsideration and allowance of claims 27-31 and 33-38 is respectfully requested.

Additionally, regarding claim 27, nowhere does the article from Science and Technology Review disclose that materials are crystallized within pores of a sol-gel derived solid. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 28, nowhere does the article from Science and Technology Review disclose solution exchange involving exchanging the liquid phase after gelation with another liquid containing an energetic material constituent, thereby allowing deposition of the energetic material constituent within the gel. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 30, nowhere does the article from Science and Technology Review disclose utilizing reactive monomers which have functionalized sites dangling throughout the solid network after gelation, and controlling the number of functionalized sites while ensuring homogeneity at a molecular level. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 33, nowhere does the article from Science and Technology Review disclose wherein the energetic material is uniformly distributed within pores of a solid network formed by the polymerization of the reactive monomer. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 34, nowhere does the article from Science and Technology Review disclose after gelation, exchanging the liquid phase with another liquid which contains an energetic material constituent. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 36, nowhere does the article from Science and Technology Review disclose utilizing reactive monomers which have functionalized sites dangling throughout the solid network, and dissolving an energetic material in mutually compatible solvents and diffusing into the gel which allows the energetic material to react and bind to the functionalized site. For this reason as well, the claim is believed to be allowable.

Regarding claim 32, Applicants respectfully disagree that the article from Science and Technology Review discloses each and every limitation of the claim.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, the identical invention must be shown in as complete detail as contained in the claim. *Richardson v. Suzuki Motor Co.* 868 F.2d 1226, 1236, 9USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir.

1990).

Claim 32 requires making solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials. In sharp contrast, the article from Science and Technology Review fails to disclose whether any material is present in the void spaces, much less fuels, oxidizers, or other energetic composite materials. Therefore, the rejection violates the rule of *Verdegaal Bros. and Richardson, supra*, and must be withdrawn.

Claims 40 and 41 depend from claim 32, and therefore incorporate the limitations of claim 32. By virtue of their dependence, claims 40 and 41 are also believed to be allowable. Reconsideration and allowance of claims 40 and 41 is respectfully requested.

Claim 45 has been amended to require producing a solid energetic material comprising at least one of an explosive, a propellant, and a pyrotechnic. Support for this amendment is found, *inter alia*, on p. 1, lines 8-12 of the present application as filed.


As noted in the "Response to Arguments" section of the office action, the prior art of record fails to disclose actual energetic materials. Therefore, by virtue of the amendment, claim 45 is believed to be allowable. Reconsideration and allowance of claim 45 is respectfully requested.

#### Conclusion

In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he or she is respectfully requested to initiate the same with the undersigned at (925) 422-7073

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Respectfully submitted,



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